AD-A106 338 ARMY ENGINEER DISTRICT NORFOLK VA F/G 13/13
NATIONAL DAM SAFETY PROGRAM. WILLIAMS DAM (INVENTORY NUMBER VA --ETC(U)
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STAUNTON RIVER BASIN

AD A106338

LEVEL II

(1)

Name Of Dam: WILLIAMS
Location: PATRICK COUNTY
Inventory Number: VA 14111

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PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM.

(6) Williams Dam (Inventory Number VA 14111), Staunton River Basin, Patrick County, Virginia. Phase I Inspection Report.

U.S. ARMY CORPS OF ENGINEERS · NORFOLK DISTRICT ·

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by Boris G. /Taran

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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1 REPORT NUMBER: VA 14111 — 2 GOVT ACCESSION NO: AD-A106 338	3 RECIPIENT'S CATALOG NUMBER
4 TITLE (and Subtitle): Phase I Inspection Report National Dam Safety Program — Williams Patrick County, VA	5 TYPE OF REPORT & PERIOD COVERED: Final 6 PERFORMING ORG. REPORT NUMBER
7 AUTHOR(s): Norfolk District, Boris O. Laran	8 CONTRACT OR GRANT NUMBER(s)
9 PERFORMING ORGANIZATION NAME AND ADDRESS: U. S. Army Engineer District, Norfolk 803 Front St., Norfolk, VA 23510	10 PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11 CONTROLLING OFFICE NAME AND ADDRESS: U. S. Army Engineer District, Norfolk 803 Front St., Norfolk, VA 23510	12 REPORT DATE: September 1981 13 NUMBER OF PAGES
14 MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15 SECURITY CLASS. (of this report): Unclassified 15a DECLASSIFICATION/DOWNGRADING SCHEDULE
16 DISTRIBUTION STATEMENT (of this Report): Approved for public release; distribution unlimited	
17 DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)	
18 SUPPLEMENTARY NOTES: Copies are obtainable from National Technical Information Service, Springfield, Virginia 22151	
19 KEY WORDS (Continue on reverse side if necessary and identify by block number): Dams - VA National Dam Safety Program Phase I Dam Safety Dam Inspection	
20 ABSTRACT (Continue on reverse side if necessary and identify by block number): (See Reverse Side)	

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I Inspection is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspection. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

ROANOKE RIVER BASIN

NAME OF DAM: WILLIAMS
LOCATION: PATRICK COUNTY
INVENTORY NUMBER: VA 14111

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

PREPARED BY
NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

SEPTEMBER 1981

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

BRIEF ASSESSMENT OF DAM

Name of Dam:	Williams Dam
State:	Virginia
Location:	Patrick County
USGS Quad Sheet:	Stuart, Virginia
Stream:	Tributary of North Fork
Date of Inspection:	4 September 1981

Williams Dam is an earthfill dam about 250 feet long and 28.6 feet high. The dam is owned and maintained by Mr. Dorn V. Williams. The dam is classified as a small dam with a significant hazard classification. The principal spillway is a 30-inch corrugated metal pipe drop-inlet connected to a 24-inch CMP passing through the dam at low level. The emergency spillway is an open channel cut into the right abutment. The reservoir provides recreation.

Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the Spillway Design Flood (SDF) is the 1/2 PMF. The emergency spillway will pass 11 percent of the PMF or 22 precent of the SDF without overtopping the crest of the dam. The SDF will overtop the dam by a maximum of 2.15 feet, reach an average critical velocity of 5.6 feet per second and flow over the dam for 3.75 hours. Flows overtopping the dam during the SDF are not considered detrimental to the embankment. The spillway is adjudged inadequate but not seriously inadequate.

The visual inspection revealed no apparent problems or remedial measures in need of immediate attention. A stability check of the dam is not required. It is recommended that a formal maintenance program and warning system be established. The maintenance items listed in Section 7.2 should be accomplished as a part of the regular maintenance program within the next 12 months.

Submitted By:

Original signed by:
Carl S. Anderson, Jr.

CARL S. ANDERSON, JR., P.E.
Acting Chief, Design Branch

Approved:

Original signed by:
Ronald E. Hudson

RONALD E. HUDSON
Colonel Corps of Engineers
Commander and District Engineer

Date: SEP 28 1981

Recommended By:

Original signed by
JACK G. STARR

JACK G. STARR, P. E.
Chief, Engineering Division

DAM

RESERVOIR

OVERALL VIEWS - WILLIAMS DAM
PATRICK COUNTY

4 SEPTEMBER 1981

SECTION 1

PROJECT INFORMATION

1.1 General:

1.1.1 Authority: Public Law 92-367, 8 August 1972, authorized the Secretary of the Army, through the Corps of Engineers to initiate a National Program of Safety Inspections of Dams throughout the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.

1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams (Reference 1, Appendix V). The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

1.2 Project Description:

1.2.1 Dam and Appurtenances: Williams Dam is an earthfill structure about 250 feet long and 28.6 feet high. The crest of the dam is 16 feet wide at elevation of 1480.0 feet mean sea level (ft. m.s.l.). The upstream slope is 2.2 horizontal to 1 vertical (2.2H:1V) and the downstream slope is 3.0H:IV. There is no slope protection.

It is unknown if the foundation is keyed into the underlying material. There is an intercepting drainage system located in the downstream embankment as shown on the as-built drawings, available through the local Soil Conservation Service Office . The 6-inch CMP outlet for the drainage system is located about 10 feet to the right of the principal spillway outlet, and discharges into the discharge channel.

The principal spillway consists of a 30-inch corrugated metal pipe (CMP) drop-inlet with a crest elevation of 1474.0. A 24-inch CMP connected to the drop inlet passes through the dam at low level and discharges into the downstream channel.

The emergency spillway is an open channel cut into the right abutment. The emergency spillway crest is 50 feet wide at elevation 1477.2.

The reservoir can be dewatered by operation of an 18-inch shear gate connected to the bottom of the drop inlet.

1.2.2 Location: Williams Dam is located just off U. S. Route 58, about 1 mile northwest of the intersection of U. S. Route 58 and State Route 8 in Patrick County.

1.2.3 Size Classification: The dam is classified as a small size structure as defined by Reference 1 of Appendix V.

1.2.4 Hazard Classification: The dam is located just upstream of U. S. Route 58 and four homes along the channel. These homes could sustain heavy damage should the dam fail. Therefore, the dam is assigned a significant hazard classification according to guidelines contained in Section 2.1.2 of Reference 1, Appendix V. The hazard classification used to categorize dams is a function of location only and has nothing to do with their stability or probability of failure.

1.2.5 Ownership: Mr. Dorn V. Williams

1.2.6 Purpose: The reservoir provides recreation.

1.2.7 Design and Construction History: The dam was designed by the U. S. Department of Agriculture Soil Conservation Service (SCS). The SCS indicates that Mr. John C. West of Vesta, Virginia and Mr. Marvin Belcher of Floyd, Virginia constructed the dam, which was completed in 1979.

1.2.8 Normal Operational Procedures: Water pass automatically through the principal spillway as the reservoir rises above 1474.0. As the reservoir rises, water will flow through the emergency spillway crest elevation 1477.2

1.3 Pertinent Data:

1.3.1 Drainage Area: The dam controls a drainage area of 0.92 square miles.

1.3.2 Discharge at Dam Site: Maximum flood unknow.

Pool level at top of dam

Emergency Spillway.....656 cfs

1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir are shown in the following table:

TABLE 1.1 DAM AND RESERVOIR DATA

Item	Elevation feet msl	Reservoir Area Acres	Reservoir Capacity Acre feet	Reservoir Capacity Watershed, Inches	Length, feet
Crest of Dam	1480.0	8.3	110.2	2.2	1120
Emergency Spillway Crest	1477.2	7.2	92	1.9	850
Principal Spillway Crest	1474.0	5.7	67	1.4	670
Streambed at downstream toe of dam	1451.4±	-	-	-	-

SECTION 2

ENGINEERING DATA

2.1 Design: The dam was designed under the direction of the Soil Conservation Service. As-built drawings and design data are available at the Soil Conservation Service, USDA, County Office Building, P. O. Box 7, Collinsville, Virginia, 24078.

The design review included the following:

a. As-built drawings.

b. A location drawing for the intercepting drainage system in the downstream embankment.

A subsurface investigation was conducted along the centerline of the dam and in the reservoir area. Four holes were advanced along the centerline ranging in depth from 12 inches to 30 inches. Four additional holes were advanced in the reservoir area to depths from 24 inches to 30 inches. All holes indicated a clay or silt, and rock was encountered in five holes at depths ranging from 12 inches to 30 inches. The methods of drilling and sampling are not indicated. A copy of the location drawing, with the drilling logs are included in Appendix IV.

Hydrologic calculations were also provided. A copy of these calculations is in Appendix IV.

2.2 Construction: As-built drawings were furnished by the Soil Conservation Service and are on file at the local S.C.S. office. No additional construction records are available.

2.3 Evaluation: The available information is insufficient to evaluate foundation conditions and embankment stability.

SECTION 3

VISUAL INSPECTION

3.1 Findings:

3.1.1 General: The results of the 4 September 1981 inspection are recorded in Appendix III. At the time of the inspection, it was raining and the temperature was about 65°F. The pool elevation was 1474.0, or about normal pool. The tailwater elevation was at 1452.3. There are no known prior inspections reports.

3.1.2 Embankment: The embankment is in good condition. Sketches showing a plan view, cross section and crest profile are provided in Appendix I. An overview of the dam is provided at the beginning of the report.

There are no signs of surface cracks, unusual movement, sloughing, seepage, or misalignment. There is no riprap protection or the upstream slope. The upstream and downstream slopes as well as the crest are covered with grass. There is a small cedar tree located at the downstream toe.

The as-built drawings indicate an intercepting drainage system in the downstream embankment. The 6-inch CMP outlet had a flow of approximately 2 to 3 gallons per minutes at the time of the inspection. The outlet pipe is located about 10 feet to the right of the principal spillway outlet at the toe of the dam.

The area soils are a high plastic, micaceous clay.

3.1.3 Principal Spillway: A 30-inch CMP serves as the principal spillway drop inlet riser. The intake is surrounded by a 54-inch CMP extended above the drop inlet, and covered with a metal trash rack. An emergency gate valve is located about 75 feet upstream of the drop inlet. The outlet pipe discharges into a small stilling basin. The principal spillway is in excellent condition.

3.1.4 Emergency Spillway: The emergency spillway is located in natural ground in the right abutment. The flow will drop sharply down the right abutment into the flood plain then enter the downstream channel about 100 feet below the toe of the dam. The channel has a good grass cover. There are two aluminum boats in a metal storage rack at the entrance of the channel.

3.1.5 Instrumentation: There is no instrumentation on the dam.

3.1.6 Reservoir Area: The reservoir slopes are gentle with half the slopes grassed and the other heavily wooded. There was no debris observed in the reservoir. There is no available information pertaining to sedimentation.

3.1.7 Downstream Channel: The downstream channel is narrow and shallow and meanders along U. S. Route 58 for about a mile. The flood plain is about 200 feet wide with the road embankment bordering the flood plain. The slopes are gentle to mild and primarily covered with grass and some trees. There are 4 homes in the downstream area.

3.2 Evaluation: Overall, the dam appears to be in excellent condition. However, the inspection revealed three preventive maintenance items which should be scheduled as part of an annual maintenance program. These are:

a. The cedar tree located at the downstream toe should be cut down at the ground surface.

b. A staff gage should be installed in the reservoir to extend above the top of the dam.

c. The two alluminum boats and the storage rack should be removed from the entrance of the emergency spillway.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedures: The operation of the dam is automatic. As the reservoir rises above elevation 1474.0, water will pass through the principal spillway. Water will also pass through the emergency spillway as the reservoir rises above elevation 1477.2. The reservoir can be dewatered by operating the shear gate valve connected to the low level outlet in the reservoir.

4.2 Maintenance: Maintenance is performed as needed by the owner.

4.3 Warning System: At the present time, there is no warning system or evacuation plan for the dam.

4.4 Evaluation: The dam does not require an elaborate operational and maintenance procedure. However, the present program of periodic observation and maintenance should be documented to help detect and correct any problems that may arise. An emergency operation and warning plan should be developed. It is recommended that a formal emergency procedure be prepared to be readily available to anyone managing the facility. This should include:

a. How to operate the dam during an emergency.

b. Who to notify, including public officials, in case evacuation from the downstream area is necessary.

SECTION 5
HYDRAULIC/HYDROLOGIC DATA

5.1 Design: A peak rate of discharge from small watersheds data sheet developed for a 50-Year Flood by the U. S. Department of Agriculture, Soil Conservation Service was provided for Williams Dam.

5.2 Hydrologic Information: None were available.

5.3 Flood Experience: The maximum flood is unknown.

5.4 Flood Potential: The 100-Year Flood, 1/2 PMF, and PMF were developed using the HEC-1DB computer program (Reference 2, Appendix V) and appropriate unit hydrograph, precipitation and storage-outflow data. Clark's Tc and R coefficients for the local drainage area were estimated from basin characteristics. The rainfall applied to the developed unit hydrograph was obtained from a U. S. Weather Bureau Publication (Reference 3 and 4 Appendix V).

5.5 Reservoir Regulations: Pertinent dam and reservoir data are shown in Table 1.1.

Water passes automatically through the principal and emergency spillways as the reservoir rises above each crest.

The storage curve was developed based on areas obtained from the Stuart, Virginia U. S. Geological Survey Quadrangle Map. Rating curves were developed for the principal spillway, emergency spillway and non-overflow section of the dam. In routing hydrographs through the reservoir, it was assumed that the initial pool level was at normal pool (elevation 1474.0). Flow through the principal spillway was neglected during routings.

5.6 Overtopping Potential: The probable rise in the reservoir and other pertinent information on reservoir performance is shown in the following table:

Table 5.1 RESERVOIR PERFORMANCE

Item	Normal Flow	100-Year Flood 1/	1/2 PMF	PMF 2/
Peak flow cfs				
Inflow	1	1090	3387	6773
Outflow	1	1090	3382	6747
Maximum elevation feet msl	1474.0	1480.35	1482.15	1483.87
Non-over flow section (el 1480.0)				
Depth of flow, feet.	---	0.35	2.15	3.87
Duration, hrs.	---	1.00	3.75	6.50
Velocity, fps 3/	---	2.6	5.6	8.8
Tailwater elevation feet msl	1452.3	---	---	----

1/The 100-Year Flood has one chance in 100 of occurring in any given year.
2/The PMF is an estimate of flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.
3/Critical Velocity

5.7 Reservoir Emptying Potential: An 18-inch shear gate, located at the bottom of the reservoir, is available to dewater the reservoir. The low level outlet will permit a withdrawal of about 38 cfs with the reservoir at the crest of the principal spillway (elevation 1474.0) and essentially dewater the reservoir in about 1.5 days. This is equivalent to an approximate drawdown rate of 11.3 feet per day based on the hydraulic height measured from normal pool divided by the time to dewater the reservoir.

5.8 Evaluation: Based on the size (small) and hazard classification (significant), the Recommended Spillway Design Flood is the 100-Year Flood to the 1/2 PMF. Based on the risk involved in the project, the 1/2 PMF has been selected as the SDF. The emergency spillway can pass 11 percent of the PMF or 22 percent of the SDF without overtopping the crest of the dam. During the SDF the dam will be overtopped by a maximum 2.15 feet, reach a maximum average critical velocity of 5.6 feet per second, and remain above the dam for about 3.75 hours.

Conclusion pertain to present day conditions. The effect of future development on the hydrology has not been considered.

SECTION 6

DAM STABILITY

6.1 Foundation and Abutment: There is no detailed information available on the foundation conditions. The dam is located in the inner Piedmont Physiographic Province. The rocks in the area are of Cambrian or Precambrian Age and consist of both igneous and metamorphic types. Rocks identified in the area include schist, quartzite, gneiss, and granite. Overburden material is comprised of terrace deposits, colluvial deposits, alluvial deposits, and weathered rock. Topography consist of rolling terrain and steep sided ridges. There are no rock outcrops at the dam site. The area is drained by the south Mayo River and its tributories. It is not known if the foundation was keyed into the underlying material. There is an intercepting drainage system as indicated on the as-built drawings. The as-built drawings are on file at the local office of the Soil Conservation Service.

6.2 Embankment:

6.2.1 Material: There is no detailed information available on the embankment materials. The surface material on the embankment is a high plastic, micaceous clay. The nature of the embankment materials is considered to be homogeneous.

6.2.2 Stability: There are no available stability calculations. The dam is 28.6 feet high and 16 feet wide at the crest. The upstream slope is 2.2H:1V, and the downstream slope is 3.0H:1V. The normal pool elevation is 1474.0 feet MSL. The maximum storage pool elevation is approximately 1472.2 feet MSL, the elevation of the low point of the emergency spillway.

According to the guidelines presented in Design of Small Dams, U. S. Department of the Interior, Bureau of Reclamation for small homogenous dams, with a stable foundation, subjected to a sudden drawndown and composed of silts and clays, the recommended slopes are 4.0H:1V and 2.5H:1V for the upstream and downstream slope, respectively. The recommended width is 15.6 feet. Based on these guidelines, the dam has an inadequate upstream slope, but an adequate downstream slope and crest width.

6.2.3 Seismic Stability: The dam is located in Seismic Zone 2. Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, the dam is considered to have no hazard from earthquakes provided static stability conditions are satisfactory and conventional safety margin exist.

6.2.4 Evaluation: There is insufficient information to adequately evaluate the stability of the dam. However, the visual inspection revealed no apparent instability. Based on Bureau of Reclamation Guildlines, the downstream slope and crest width are adequate, but the upstream slope is inadequate. The embankments are considered stable during both normal pool and maximum storage pool operations. In addition, overtopping is not considered critical because flows are shallow, last only 2.75 hours, and the velocity is less than 6 fps, the effective eroding velocity for a vegetated earth embankment. Although the upstream slope is inadequate a stability analysis is not required, because of the adequate downstream slope and crest width, and also the visual inspection revealed no apparent problems.

SECTION 7

ASSESSMENT/ REMEDIAL MEASURES

7.1 Dam Assessment: There is insufficient engineering data. However, the visual inspection did not reveal any findings that would prove the dam unsound. Overall, the dam appears to be in excellent condition, and no immediate remedial measures are required. A stability check is not required.

The Corps of Engineers Guidelines indicate the appropriate spillway design flood (SDF) for the dam is 1/2 PMF, since the dam is classified as being small with a significant hazard. The emergency spillway will pass 11 percent of the PMF or 22 percent of the SDF without overtopping the crest of the dam. Flows overtopping the crest of the dam during the SDF are not considered detrimental to the dam. The spillway is considered inadequate, but not seriously inadequate. Overall the dam is in excellent condition and there is no immediate need for remedial measures.

7.2 Recommended Remedial Measures: It is recommended that the regular maintenance operation program be documented for future reference. A formal emergency procedure and warning system should be developed and put into operation as soon as possible. This should include how to operate the dam during an emergency, and who to notify, including public officials, in case evacuation from the downstream area is necessary. The local emergency services coordinator of the State Office of Emergency and Energy Service can assist in the preparation of an emergency warning plan.

Also, the inspection revealed the following maintenance items that should be scheduled during a regular maintenance period within the next 12 months:

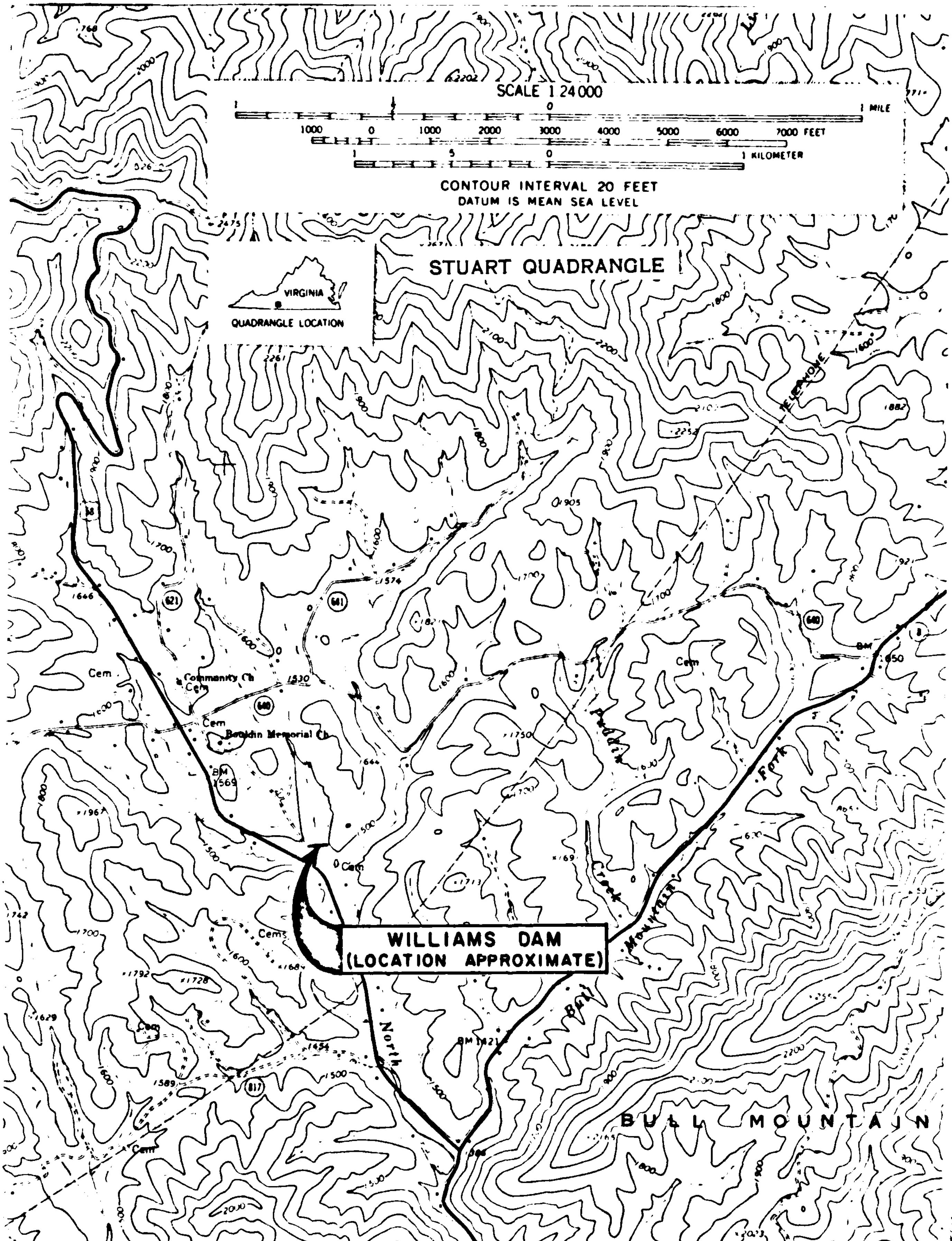
a. Cut the small cedar tree located at the downstream toe even with the ground surface. Remove any trees and brush found during subsequent maintenance inspections.

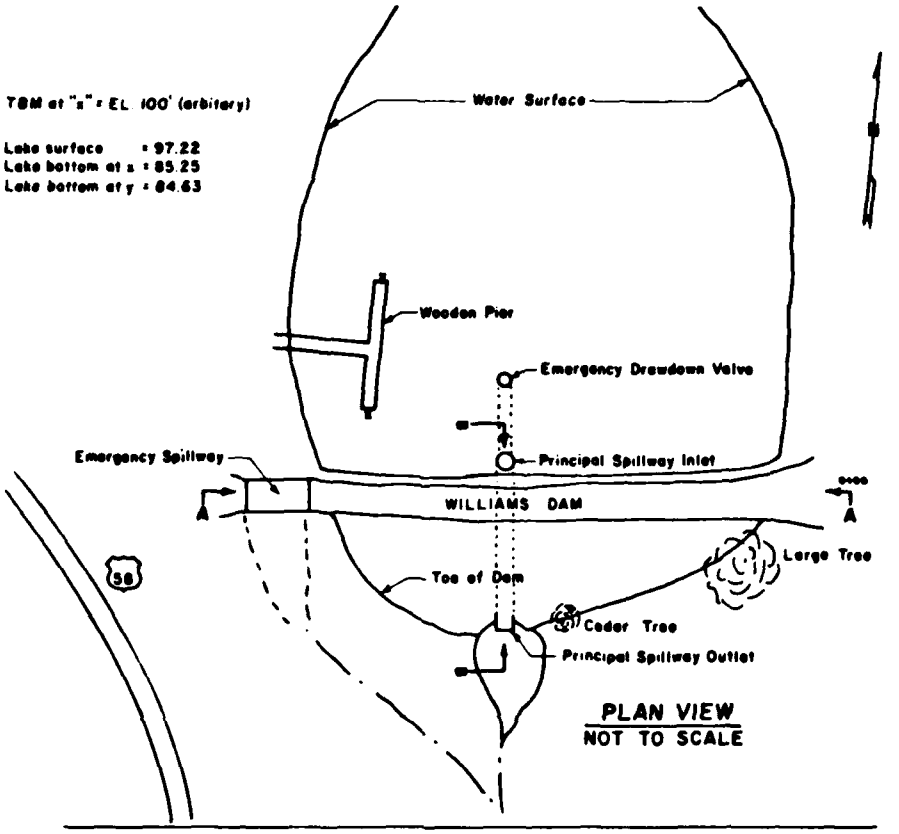
b. Install a staff gage in the reservoir to extend above the crest of the dam.

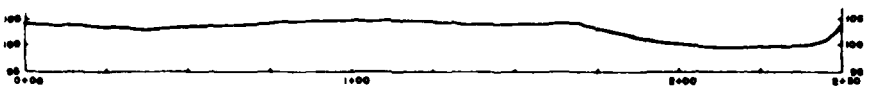
c. The two aluminum boats and the storage rack should be removed from the entrance of the emergency spillway.

APPENDIX I

MAPS AND DRAWINGS


SCALE 1 24000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
STUART QUADRANGLE
VIRGINIA
QUADRANGLE LOCATION
TELEPHONE
Cem
Community Ch
Boaldin Memorial Ch
Puddin
Creek
Fork
Bull Mountain
North
WILLIAMS DAM
(LOCATION APPROXIMATE)
Cems
BULL MOUNTAIN





PROFILE A-A

CROSS SECTION B-B

WILLIAMS DAM
PATRICK COUNTY
NORFOLK DISTRICT
CORPS OF ENGINEERS
3 SEPTEMBER 1981

PLATE II

APPENDIX II

PHOTOGRAPHS

PHOTO #1 CREST OF DAM

PHOTO #2 UPSTREAM FACE
OF DAM

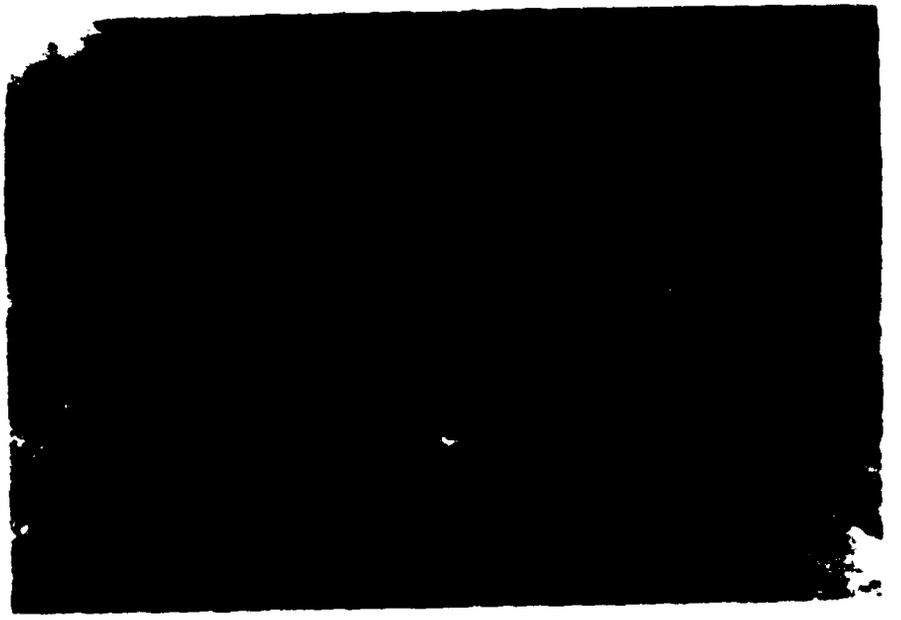


PHOTO #3 DOWNSTREAM FACE

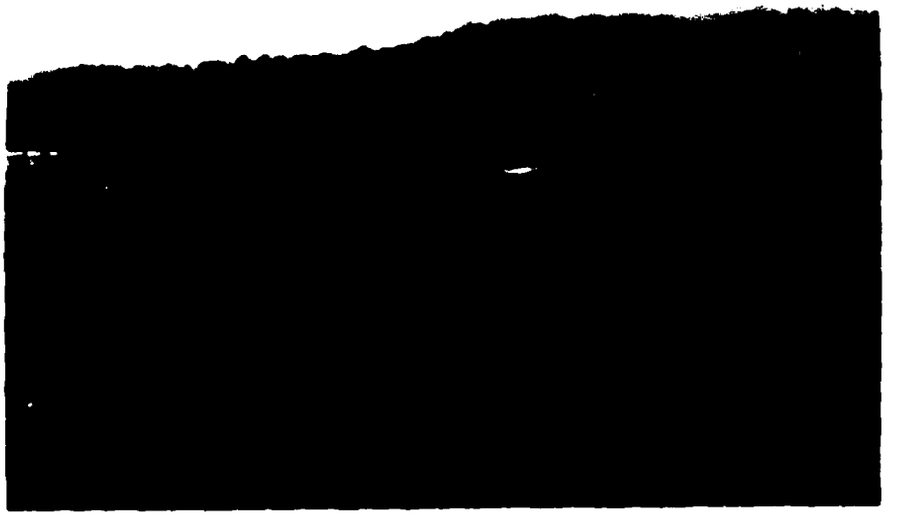


PHOTO #4 EMERGENCY SPILLWAY
APPROACH CHANNEL

PHOTO #5 EMERGENCY SPILLWAY
DISCHARGE CHANNEL

PHOTO #6 PRINCIPAL SPILLWAY OUTLET
AND TOE DRAIN OUTLET

APPENDIX III

FIELD OBSERVATION

Check List
Visual Inspection
Phase I

Name Dam: Williams County: Patrick State: Virginia Coordinates: Lat. 3641.5
Long. 8017.2

Date Inspection: 4 Sept 81 Weather: Rain Temperature: 64° - 68°F

Pool Elevation at Time of Inspection: 97.2 TBM
1474.0 FT. MSL

Tailwater at Time of Inspection: 75.5 TBM
1452.3 FT MSL

Inspection Personnel:

B. Taran, COE
Jim Robinson, COE
Len Jones, COE
Joe Miller, COE
Ed Constantine, SWCB

Miller & Robinson Recorders

* TBM set at elevation 100 (located downstream end of wooden pier in reservoir)

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	No surface cracks were visible.	None.
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	There is no unusual movement or cracking at or beyond the toe.	None.
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	There is no sloughing or erosion on the embankment and abutment slopes.	None.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	There are no drawings to compare the alignment. However, the alignments showed no signs of movement.	None.
RIPRAP FAILURES	There is no riprap.	None.

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
FOUNDATION	The foundation appears stable with no noticeable defects.	None.
ANY NOTICEABLE SEEPAGE	There is no noticeable seepage.	None.
DRAINS	There is a 6-inch CMP toe drain outlet located about 10 feet right of the principal spillway outlet. There is a flow of about 2 to 3 gal/min. coming from the pipe.	None.
MATERIALS	Area soils consists of high plastic, micaceous clays.	None.
VEGETATION	The upstream and downstream slopes and the crest are covered with grass. There is a small cedar tree at the downstream toe.	The cedar tree should be cut down at the ground surface.

PRINCIPAL SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONTROL SECTIONS	The control section is a 30-inch corrugated metal pipe (CMP) drop-inlet riser located about 5 feet upstream of the embankment. A 54-inch CMP is extended above the drop-inlet with a metal trash rack cover. It is in excellent condition.	None.
APPROACH CHANNEL	The approach channel is the reservoir.	None.
DISCHARGE CHANNEL	The discharge channel outlet is a 24-inch CMP that passes flow into a small natural stilling basin.	None.
BRIDGE AND PIERS	A wooden T-shape pier extends from the right reservoir bank.	None.
EMERGENCY GATE	An emergency gate valve is located about 75 feet upstream of the principal spillway riser. An 18-inch shear gate is located at the bottom of the reservoir with the control stem above normal pool.	None.

EMERGENCY SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONTROL SECTIONS	The control section is an earthen open channel in the right abutment. There is a good grass cover.	None.
APPROACH CHANNEL	The approach channel is a mild slope with good grass cover. There are two aluminum boats and a metal storage rack located in the approach channel.	The aluminum boats and storage rack should be moved from the emergency spillway entrance.
DISCHARGE CHANNEL	The discharge channel has a good grass cover. Flow will drop sharply into the flood plain then enter the downstream channel about 100 feet below the toe of the dam.	None.

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
MONUMENTATION/SURVEYS	There are no known monuments in the immediate area.	None.
OBSERVATION WELLS	There are no wells.	None.
WEIRS	There are no weirs.	None.
PIEZOMETERS	There are no piezometers.	None.
STAFGAGE	There is no staff gage.	A staff gage should be installed in the reservoir to extend above the crest of the dam.

RESERVOIR

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The reservoir slopes are gentle with half the slopes grassed and the others heavily wooded. There is no debris around the reservoir. The reservoir was extremely muddy due to recent rains.	None.
SEDIMENTATION	The inspection team was unable to evaluate sedimentation in the reservoir.	None.

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	The downstream channel is narrow and shallow and meanders along U. S. Route 58 for about a mile. The flood plain is about 200 feet wide with the road embankment bordering the flood plain. There is little debris along the stream channel.	None.
SLOPES	The slopes are gentle to mild. The vegetation is primarily grass with some small areas of trees.	None.
APPROXIMATE NO. OF HOMES AND POPULATION	There are about 4 homes in the downstream area that could sustain some damage should the dam fail.	None.

APPENDIX IV

ENGINEERING AND CONSTRUCTION DATA

APPENDIX IV

ENGINEERING AND CONSTRUCTION DATA

SCS - 538
Rev. 3-67

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL INVESTIGATION TO DETERMINE SUITABILITY OF PROPOSED POND SITE

FARMER'S NAME [illegible] DISTRICT [illegible]
DATE 6/7/74 COUNTY [illegible]
S. C. S. PHOTO SHEET NO. _____ WORK UNIT [illegible]

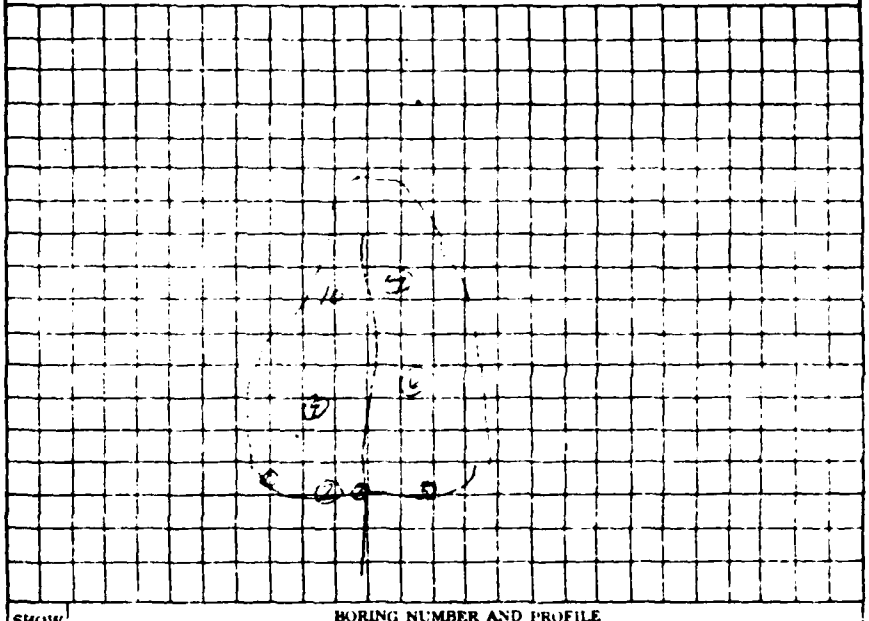
WATERSHED AREA MEASUREMENTS

CROPLAND 4 ACRES PASTURE 100 ACRES
WOODLAND 41 ACRES TOTAL 273 ACRES

POND CLASS

Donald L. Ray
WORK UNIT CONSERVATIONIST

SKETCH OF PROPOSED POND SHOWING WHERE BORINGS WERE MADE (Approx. scale 1" = _____ feet)
Locate reference point on center line of dam and identify on sketch



SHOW DEPTH SCALE

BORING NUMBER AND PROFILE

Make and list dam site and spillway borings first, then ponded area and borrow pit borings, separate with vertical red line. (Continued on back where necessary) Show water table elevations on dam site borings.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0'	CL	CL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	CL	CL														
12'	C	C	R	[illegible]	CL	[illegible]	[illegible]	C	C														
18'	C	C		[illegible]			GL	C	C														
24'	R	C		C			[illegible]	C	C														
30'		F					[illegible]	[illegible]															

BORINGS MADE BY [illegible] SIGNATURE & TITLE [illegible]

RTSC-NE-ENG-230
Feb. 1970

U. S. Department of Agriculture
Soil Conservation Service

PEAK RATES OF DISCHARGE FROM SMALL WATERSHEDS

State [illegible] | Sheet No. 1 of 1
County [illegible] | Field No. ______
Cooperator [illegible] | Computed by [illegible] Date [illegible]
Community [illegible] | Checked by [illegible] Date 6/6/79

Drainage Area is 570 Acres. | Rainfall Depth is 6.2 Inches.
Rainfall Freq. is [illegible] Years. | Avg. Watershed Slope is [illegible] Percent.

Hydrologic Soil Group 1	Land Use 2	Treatment or Practice 3	Hydrologic Condition 4	Runoff Curve Number 5	Area (Ac.) 6	Col. 5 X Col. 6 7
B	Woods	—	Good	55	[illegible]	[illegible]
B	[illegible]	[illegible]	Fair	69	50	[illegible]
B	Meadow		Good	58	[illegible]	[illegible]
B	Farmstead	—	—	74	16	[illegible]
B	Road	-	Dirt	[illegible]	2	[illegible]
B	Road		[illegible]	84	5	[illegible]
B	Row Crop	Straight row	Poor	81	[illegible]	[illegible]
				TOTALS =	570	[illegible]

Weighted Runoff Curve No. = $\frac{\text{Total Col. 7}}{\text{Total Col. 6}}$ = [illegible] = ______ ; Use ____

Q_1 (For [illegible] RCN_1) = Q(ES 1027 for [illegible] slopes) x Slope Correction Factor (Ex. [illegible])
= 450 x 1.08 = 486 cfs
Q_2 (For ____ RCN_2) = ______ x ______ = ______ cfs

Watershed RCN Minus RCN_1	C
1	.2
2	.4
3	.6
4	.8

$Q_2 - Q_1$ = ______ - ______ = ______ cfs
$\Delta Q = (Q_2 - Q_1) \times C$ = ______ x ______ = ______ cfs
Peak Discharge = $Q_1 + \Delta Q$ = ______ + ______ = 486 cfs
Runoff = 2.56 Inches (Exhibit 2-7A)

NOTE: Q_1 and Q_2 above refer to runoff resulting for RCN's to nearest 5 (60, 65, 65, 70, etc.). If computed RCN ends in 0 or 5 (60, 65, 70, etc.), Q_2 and the next three lines will not be needed. In this case, Q_1 runoff will be the Peak Discharge.

Runoff Data Sheet

30 [illegible]

VA-ENG-103
February 1970

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

EARTHWORK COMPUTATION SHEET

Soil Conservation District _____ County _____

Farmer's Name _____ Address _____

Job _____

Additional Description _____

STATION	FILL [illegible] (Feet)	TOP WIDTH OF EXCAVATION (Feet)	SIDE SLOPES	END AREA (Sq. Ft.)	SUM OF END AREAS (Sq. Ft.)	DISTANCE (Feet)	DOUBLE VOLUME (Cu. Ft.)
0+00		4	2:1	—	—	—	
0+20	7.2			8.6	8.6	20	172
0+40	2.7			21.5	30.1	20	602.0
1+00	20.8			48.7	70.2	20	1404.0
1+20	22.8			60.0	108.7	20	2174.0
1+40	25.3			72.1	132.1	20	2642.0
1+60	22.2			57.2	129.3	20	2586.0
1+80	19.2			44.1	101.3	20	2026.0
2+00	13.4			23.6	67.7	20	1354.0
2+20	4.9			4.8	28.4	20	568.0
2+30	0			0	4.8	10	48.0
						2	1351.0
						7	7732

APPENDIX V

REFERENCES

APPENDIX V

REFERENCES

1. Recommended Guidelines for Safety Inspection of Dams, Office of the Chief of Engineers, Department of the Army, Washington, D. C.

2. HEC-1DB Flood Hydrograph Package, (Hydrologic Engineering Center, U. S. Army Corps of Engineers, September 1978.)

3. "Probable Maximum Precipitation Estimates, United States East of the 105th Meridian," Hydrometeorological Report No. 51, (U. S. Weather Bureau, June 1978).

4. "Rainfall Frequency Atlas of the Unites States", Technical Paper No. 40, (U.S. Weather Bureau, May 1961).

END

DATE
FILMED

11-81

DTIC